Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Development
Agricultural Development & Diversification Program (ADD)
Grant Project Final Report

Contract Number: **24055**

Grant Project Title: **Storage evaluation of new chipping cultivars**

Amount of Funding Awarded: $**25,000**

Name of Principal Contact Person: **Duane Maatz and Karen Walters**

Organization: **Wisconsin Potato and Vegetable Growers Association**

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Report Submitted on: **10/15/2010**

Please use the following questions as a guide for writing your grant project final report. In your final report, please answer each question as it relates to your grant project.

1) What was the original intent of the grant?

- What did you want to accomplish with the grant?

1) Monitor chemical maturity of MegaChip or alternative variety to demonstrate optimal harvest timing.

2) Identify and demonstrate optimal temperature management for preconditioning and long-term storage of MegaChip or alternative variety.

3) Quantify factors influencing the storability of MegaChip and other varieties to demonstrate the value over an extended storage season.

- How was it expected to benefit Wisconsin Agriculture?

Identification of potato varieties and management systems that would provide a 12 month supply of raw product for chipping. Potato varieties with long term storage potential and increased tolerance to scab were targeted. These varieties could increase market opportunities for Wisconsin chip potato growers and private chipping companies located in Wisconsin and the NorthCentral region. Extending sale of chipping potatoes could mean increased sale of chipping potatoes totaling several million dollars for growers and similar savings on transportation costs for other production regions for local chipping companies.

- What makes this project work important or significant?

There are 6 to 12 different chip potato growers in Wisconsin that could benefit from increased market opportunity. Kettle foods is a Wisconsin based chip processing facility in Rock County that is considering expansion of current facilities or construction of new processing plant in Wisconsin. Availability of raw product of consistent quality for 12 months per year is critical criteria in consideration of expansion in Wisconsin.

2) What steps did you take to reach your goal?

- What worked?

Storage trials were effective as planned and implemented.

- What challenges did you face?

The largest single challenge we faced was availability of seed of new varieties with high potential for processing. We are continuing evaluations of CO95051 and W2133 for long term storability of chipping potatoes. We continue to evaluate chipping potential and agronomic performance of NY 138, NY 139, and W2717-5. The United States Potato Board, WPVGA, and UW Madison continue to search new potato varieties with long term storage potential.

MegaChip does not have long term cold induced sweetening tolerance. Alternative varietie

- What would you do differently?

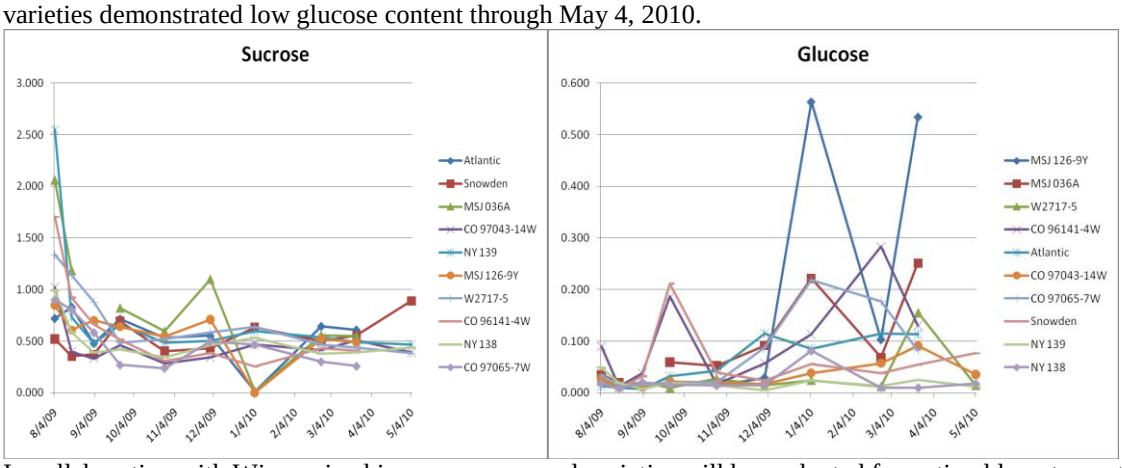
We will continue to evaluate promising chipping lines in commercial scale trials.

3) What were you able to accomplish?
What are the results from this project?
W2310 processed for chipping after storage until June in 2009 and May until 2010. Small scale research shows that CO95051, W2133, W2717-5, NY 138, and NY 139 all showed long term chipping potential.

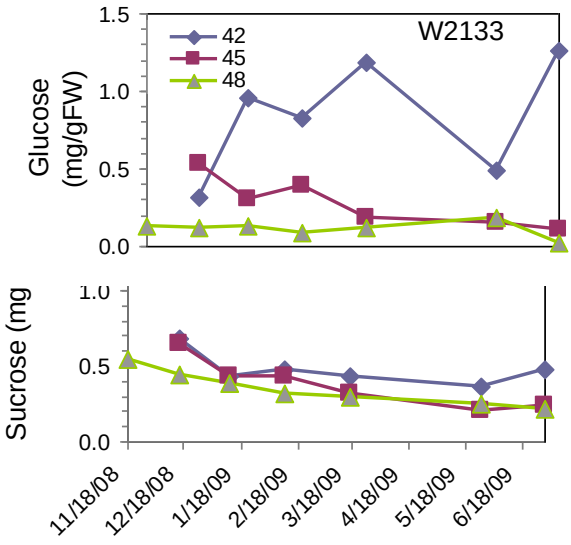
- Include any analysis of data collected or materials developed through project work.

- Monitor chemical maturity of MegaChip or alternative variety to demonstrate optimal harvest timing.

During the 2009 experiment several varieties continue to have good chemical maturity (sucrose content) going into storage. Nearly all varieties and breeding lines evaluated have reach chemical maturity by September 4, 2009. These potatoes were subsequently vine killed on that week and harvested 2 to 3 weeks later. Sucrose content remained low in storage indicating cold induced sweetening tolerance to at least 48 F. Glucose is a good indicator of chip color and acceptability and we are particularly interested in identifying chipping potatoes with Glucose content < 0.035 until May or June. Several potato varieties demonstrated low glucose content through May 4, 2010.



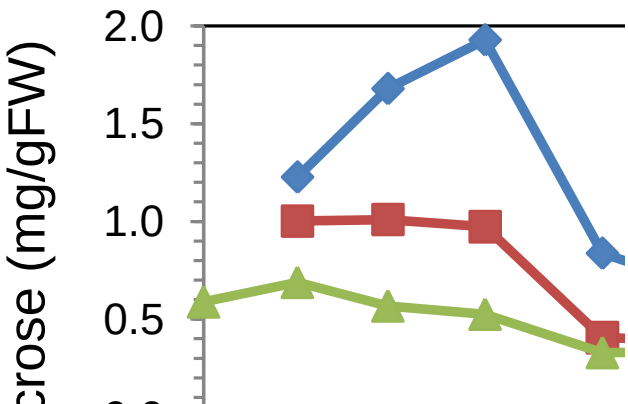
In collaboration with Wisconsin chip growers, several varieties will be evaluated for optimal long term storage based on these results. We will conduct optimal agronomic and storage management of NY 139, W2717-5, CO95029, and W5013. We have already completed optimization trials for MegaChip, White Pearl, W2133, and W2310.



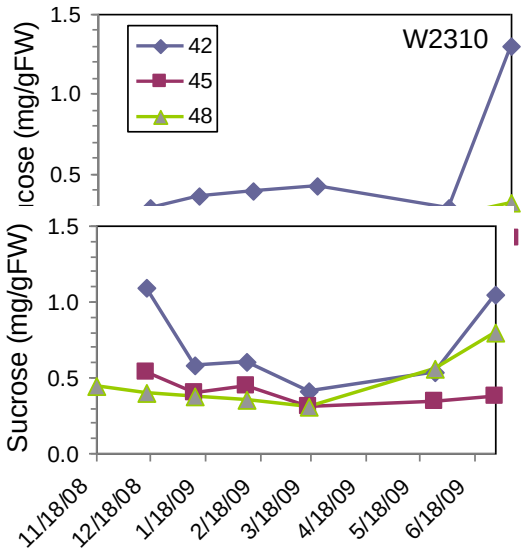
- Identify and demonstrate optimal temperature management for preconditioning and long-term storage of MegaChip or alternative variety.

W2133, W2717-5, and W2310 all expressed long term storage potential in optimal trials during 2008-2009 storage season. W2133 showed good cold induced sweetening tolerance all the way until the end of June as indicated by glucose concentrations of less than 0.035. W2133 seed has been fast tracked and increased to allow for commercial production by Wisconsin and other chip potato growers in summer of 2010.

W2717 also expressed tremendous potential for long term cold storage. Glucose remained below 0.035 mg/g until 6/18/2010 at 45 and 48 F as was seen in W2133. W2717-5 seed has been entered into the fast track program. The



seed is being cleaned and increased for commercial production by 2011 or 2012.



W2310 also has potential for long term storage as chipping potato. Notice that storage at 45 F is important for long term storage.

W2133, CO95026 are being grown by commercial growers for evaluation in commercial bin trials at the Hancock Ag Research Station. This is being conducted under separate funding.

3) Quantify factors influencing the storability of MegaChip and other varieties to demonstrate the value over an extended storage season.

W2310 stored at 45 and 48 F in commercial bin trials at the Storage Research Facility. Potatoes maintained good quality until April 1, but began to sensescent sweeten by the end of April. The cooperating grower was able to store W2310 until June.

SUCROSE		Oct 06	Oct 26	Nov 04	Nov 09	Nov 19	Dec 04	Dec 14	Dec 21	Jan 14	Feb 19	25-Feb	4-Mar	18-Mar	1-Apr	14-Apr	29-Apr	29-Apr
Bin 4	W2310	0.629	1.058	0.658	.	0.675	0.397	0.249	0.578	0.333	0.303	0.310	0.328	0.597	0.708	0.803		
Bin 5	W2310	0.680	0.568	0.700	.	0.790	0.493	0.347	0.740	0.657	0.432	0.468	0.450	0.418	0.372	0.570	1.085	0.432

GLUCOSE		Oct 06	Oct 26	Nov 04	Nov 09	Nov 19	Dec 04	Dec 14	Dec 21	Jan 14	Feb 19	25-Feb	4-Mar	18-Mar	1-Apr	14-Apr	29-Apr	29-Apr
Bin 4	W2310	0.005	0.085	0.102	.	0.055	0.028	0.021	0.105	0.002	0.017	0.028	0.015	0.052	0.045	0.077		
Bin 5	W2310	0.023	0.021	0.030	.	0.037	0.078	0.022	0.057	0.033	0.035	0.033	0.030	0.052	0.048	0.143	0.225	0.016

W2310 has potential for long term storage as confirmed in commercial bin trials.
Commercial potato grower has already paid to clean seed of W2310 and is growing several hundred acres. These potatoes have been stored and sold to regional chipper this spring through the end of May. The chip company is now sourcing raw potatoes from WI based farms that grow potatoes in Missouri. Wisconsin chip potato farms have now closed the loop and are providing raw potatoes to local chipping companies for 12 months a year. This has a savings of $1.50 per cwt of chip potatoes to the chip company (the cost of shipping potatoes from FL, TX, or CA. This has a sales value of several hundred thousand dollars to WI chip potato growers.

In addition, we have completed production and storage management recommendations for White Pearl and MegaChip that are being published through UW Extension (attached). We also submitted a $5+ million grant to the USDA Specialty Crop Research Initiative based on preliminary results from this research (available upon request).

4) What conclusions can you make based on project work the analysis of collected data?

W2133 and W2717 have better long term potential than W2310.

5) What do you plan to do in the future as a result of this project?

We are evaluating commercial scale evaluation of W2133 and CO95051. We are developing production and storage protocols for W2717-5, NY 139, and CO95051. We are preparing production recommendations for W2310 and W2133.

6) What information or additional resources are needed to commercially develop this enterprise?

Continued development of seed resources of new potato chipping lines. Business incentives for expansion of chip facilities located in Wisconsin.

7) How should the agricultural industry use the results from your grant project?

Industry is already using results in production of chipping potatoes and storage of potatoes until June. New varieties may increase storage duration even longer. Chip plants are currently under discussions for expansion.